

DEVELOPMENT OF THE ALGEBRA MODULES FOR CLASS VII STUDENTS

Diska Puri Dewi^a, Abdul Taram^b

Program Studi Pendidikan Matematika Universitas Ahmad Dahlan
Jalan Ring Road Selatan, Tamanan, Banguntapan, Bantul Yogyakarta
^adiskapuridewi@gmail.com, ^btaromahmad@yahoo.com

ABSTRACT

Mathematics is an essential basic science and useful for the development of science and technology. Available teaching materials limit the use of teaching materials in the schools. Algebra material is still considered difficult for some students'. Instructional materials in the form of modules are expected to become facilities that support the learning process. This research aims to produce teaching materials in mathematic modules with the algebra materials in the Junior High School student class VII. This research development using ADDIE that is Analysis, Design, Development, Implementation, Evaluation. This study's subjects are the materials experts, media experts, and State Junior High School (SMP Negeri) 2 Gamping Sleman and Junior High School (SMP) Muhammadiyah 2 Gamping Sleman. The instrument of this research is a questionnaire. The analysis data use the qualitative and quantitative techniques to calculate the result score of feasibility in learning media development. The result of the development of teaching materials in the form of module based on the quality of each aspect in the learning media in terms of experts materials with very good category with an average score of 81, in terms of media experts with good category with an average score of 69.33, and student response with very good category with an average score of 37.81. Based on the assessment, the teaching materials in the form of the module are very suitable for learning.

Keywords: Algebra, Module, ADDIE

INTRODUCTION

Education according to Law Number 20 of 2003 concerning the National Education System, article 1 paragraph 1 explains that education is a conscious and planned effort to create an atmosphere of learning and learning process so that students actively develop their potential to have spiritual, religious, self-control power, personality, intelligence, noble character, and skills needed by himself, society, nation, and country. Thus, education must be designed to understand and increase critical thinking competency, creativity, and productivity. According to Majid (2011: 170), learning resources are defined as information presented and stored in various media forms, helping students learn as an embodiment of the curriculum. The form is not limited to, whether in printed form, video, software format, or a combination of various formats that can be used by students and teachers. The current trend of learning mathematics is learning that focuses on the active involvement of students. However, the field's reality shows that mathematics learning conducted in schools, especially SMP / MTs, is still centered on educators who apply the lecture model.

Mathematics is one of the scientific disciplines that have an important role in human life, including as a tool for solving problems both simple and complex problems. Mathematics is also used in other disciplines such as physics, chemistry, biology, statistics, Engineering, and even non-exact sciences, and mathematics can still be found. As one of the subjects at primary and secondary education levels, mathematics aims to prepare students to deal with changing circumstances and skills and react to them. In mathematics, students are taught and trained to think logically, rationally, and critically. According to (Mulyono, Hasyim, & Sutiarmo, 2014), the learning process can run effectively and efficiently if it uses teaching materials that are by students' needs, supports the competencies to be achieved by students, has a systematic description, standardized tests and learning strategies by the student. According to Majid (2011: 173-174), teaching materials are all forms of materials used to help teachers or instructors carry out teaching and learning activities.

Based on the results of interviews with mathematics teachers in grade VII on October 18, 2016, at SMP Negeri 2 Gamping, Sleman Regency, it can be concluded that mathematics is still a difficult subject to understand. Especially in algebraic material, students still have difficulty understanding algebra, arithmetic operations, and their application. SMP Negeri 2 Gamping is a school that has teaching materials in the form of textbooks from the education department. However, the manual cannot meet the needs of students in carrying out the learning process.

Based on the results of interviews with mathematics teachers in grade VII on October 20, 2016, at SMP Muhammadiyah 2 Gamping, Sleman Regency, it can be concluded that mathematics is still a difficult subject to understand. Especially in algebraic material, students still have difficulty in understanding the elements of algebra, arithmetic operations, and their application. SMP Negeri 2 Gamping is a school that has teaching materials in the form of textbooks from the education department. However, the manual cannot meet the needs of students in carrying out the learning process.

Based on the background above, mathematics teaching material is essential in helping and facilitating in understanding mathematics subject matter. From this thought, the researcher intends to conduct research and development under the title Development of Algebra Modules for Class VII Students.

METHODS

This research is research development. The media development model used is the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). This study aims to produce algebraic modules for grade VII students. The trial design in this development consists of three stages: individual test, small group test, and field test. In the individual test, the readability of the media is tested by the researchers themselves. The next step is to enter a small group test tested by media and material validation by lecturers and teachers according to their respective fields of expertise and limited trials. After learning media is declared feasible, a field test involves VII grade students of SMP Negeri 2 Gamping and SMP Muhammadiyah 2 Gamping.

Subjects in this learning media development research are Grade VII students of SMP Negeri 2 Gamping and SMP Muhammadiyah 2 Gamping, expert lecturers and teachers who can provide input on the development of instructional media as media experts, as well as expert lecturers and teachers who will provide input into the material can be loaded in learning media. Data Collection Techniques is:

1. Observation.
2. Questionnaire.
3. Interview.

Data Collection Instruments is:

- a) Media Evaluation Sheet for Experts Media and Material Experts

This evaluation sheet is used as a consideration for the revision of learning media. The aim is to determine the module's readability, obtain input, and determine whether it is suitable for schools. This evaluation sheet is prepared with alternative answers: strongly agree, agree, disagree, and strongly disagree.

- b) Student Response Sheet

Response sheets for students are used to determine student responses and improve learning media prepared with alternative answers "strongly agree, agree, disagree, and strongly disagree."

Data Analysis Techniques is:

- a) Descriptive Analysis Process
- b) Questionnaire Analysis Process

RESULTS AND DISCUSSION

This development research uses the ADDIE development model, namely analysis with situation analysis, material, and modules, design, development of teaching materials, and implementation by conducting two trials, namely limited trials and large class trials, but before testing, the first product

used to be validated by material experts and media experts. The learning material's feasibility was assessed by three material experts, namely Ahmad Dahlan University lecturer, a mathematics teacher at SMP Negeri 2 Gamping, and a mathematics teacher at SMP Muhammadiyah 2 Gamping. The learning module's feasibility based on the media aspect was assessed by three media experts, namely Ahmad Dahlan University lecturer, a Mathematics teacher of SMP Negeri 2 Gamping, and a Mathematics teacher at SMP Muhammadiyah 2 Gamping. Students' responses to the learning modules developed were known based on the questionnaire's results. They were filled out by SMP Negeri 2 Gamping and SMP Muhammadiyah 2 Gamping during limited trials and large class trials. The final step is an evaluation by looking at the questionnaire results that have been filled out by media experts, material experts, and student responses. When viewed from the material aspect, the learning module's feasibility has an average score of 81 from an ideal average score of 96. It shows that the learning media developed in terms of the material aspects are included in the excellent category. When viewed from the media display aspect, the learning module's feasibility has an average score of 69.33 from an ideal average score of 84. It shows that the developed learning media in terms of media display aspects are included in both categories.

When viewed from the students' responses, the learning module's feasibility has an average score of 37.81 from an ideal average score of 48. It shows that the learning media developed in terms of student responses are included in the excellent category. The final assessment score for the mathematics learning module developed is 226.74 from a maximum score of 276 and has very good quality. This learning module is declared very feasible as a source of learning mathematics on the subject matter of Algebra for VII grade junior high school students.

CONCLUSION

From the results of this development research, it can be concluded as follows:

1. Steps - steps for developing learning modules on algebraic material for grade VII junior high school:
 - a) The way to gather information to develop a mathematics learning module in class VII algebra is to analyze. The results of the situation analysis are the learning process in the classroom using manuals only from the education office, limited manuals from the education office so that learning takes place is not optimal, there is a worksheet book to support learning but does not make students become active learning because in the worksheet it only contains summaries material and evaluation questions so that it makes students feel confused to understand the material, then in the material analysis consultations with grade VII mathematics teachers and choosing algebraic material because this material requires a clear understanding in the learning process, and technical analysis is carried out to find out appropriate teaching materials the ability of researchers and the need to develop learning modules using modules as a means of developing teaching materials.
 - b) The learning media design begins with making a module concept map first to read the learning module. Then make the initial display design, preliminary display design, concept map display design, material display design, summary display design, final test display design, glossary display design, and cover and profile display design.
 - c) Researchers choose lecturers and teachers who are competent in their fields to validate the learning module. The learning module was validated by three material experts and three media experts to assess input and suggestions regarding the learning module's feasibility.
 - d) The researcher revised the learning module by looking at the input and suggestions given by the validator.
2. The feasibility level of learning modules developed in supporting learning algebra material:
 - a) Trials were conducted twice, namely limited trials and large class trials. Limited trials were given to 5 SMP Negeri 2 Gamping and five Muhammadiyah 2 Gamping SMP students with heterogeneous or evenly distributed abilities from high, medium, and low. It is intended that the

responses and input provided can represent all aspects of a class. Simultaneously, a large class trial was carried out on 32 students of SMP Negeri 2 Gamping and 25 SMP Muhammadiyah 2 Gamping. Researchers share this learning module in the learning process. After completing the learning module, the researcher distributes the student response questionnaire to determine students' responses to the learning module's learning process.

- b) This study's data analysis technique is a qualitative descriptive analysis technique that describes product development results in a mathematics learning module. Done by collecting data, displaying data, reducing data, and verifying data.
- c) When viewed from the material aspect, the learning module's feasibility has an average score of 81 from an ideal average score of 96. It shows that the learning module developed in terms of the material aspects is included in the excellent category.
- d) When viewed from the media display aspect, the learning module's feasibility has an average score of 69.33 from an ideal average score of 84. It shows that the learning module developed is reviewed from the media display aspect included in either category.
- e) When viewed from the students' response, the learning module's feasibility has an average score of 37.81 from an ideal average score of 48. It shows that the developed learning module was reviewed in terms of its response in the excellent category.

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